

Завдання

$$F = -2x_1 + x_2 \rightarrow \min$$

$$\begin{cases} 2x_1 + x_2 \leq 8 \\ x_1 + 3x_2 \geq 6 \\ 3x_1 + x_2 \geq 3 \\ x_1, x_2 \geq 0 \end{cases}$$

Допоміжна задача:

$$\tilde{X}(\tilde{x}) = -2x_1 + x_2 + 0x_3 + 0x_4 + 0x_5 + Mx_6 \rightarrow \min$$

$$\begin{cases} 2x_1 + x_2 + x_3 = 8 \\ x_1 + 3x_2 - x_4 + x_6 = 6 \\ -2x_1 + 2x_2 - x_4 + x_5 = 3 \\ x_i \geq 0, i = 1 \dots 6 \end{cases}$$

Результат роботи програми

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How many variables do you have? 6
How many restrictions do you have? 3

Enter coefficient of your loss function: -2 1 0 0 0 M

Enter 1 restriction:
 2 1 1 0 0 0 8

Enter 2 restriction:
 1 3 0 -1 0 1 6

Enter 3 restriction:
-2 2 0 -1 1 0 3

Basis variables are: [3 6 5]
Marks are: [M + 2 3*M - 1 0 -M 0 0]
Corner point: 6*M

Vars [include, exclude]: [2 5]

Solve row: 3
Solve column: 2

Intial table:

[ 2      1      1 0 0 0 8 ]
[                               ]
[ 1      3      0 -1 0 1 6 ]
[                               ]
[ -2      2      0 -1 1 0 3 ]
[                               ]
[ M + 2  3*M - 1 0 -M 0 0 6*M ]

Simplex table 1:

[ 3      0 1 1/2 -1/2 0 13/2 ]
[                               ]
[ 4      0 0 1/2 -3/2 1 3/2 ]
[                               ]
[ -1     1 0 -1/2 1/2 0 3/2 ]
[                               ]
[                               ]
[      M 1 3*M 1 3*M 3 ]
[ 4*M + 1 0 0 - - - - + - 0 - - - + - ]
[      2 2 2 2 2 2 ]

```

Vars [include, exclude]: [1 6]

Solve row: 2

Solve column: 1

Simplex table 2:

[0	0	1	1/8	5/8	-3/4	43/8]
[]
[1	0	0	1/8	-3/8	1/4	3/8]
[]
[0	1	0	-3/8	1/8	1/4	15/8]
[]
[0	0	0	-5/8	7/8	-M - 1/4	9/8]

Vars [include, exclude]: [5 3]

Solve row: 1

Solve column: 5

Simplex table 3:

[0	0	8/5	1/5	1	-6/5	43/5]
[]
[1	0	3/5	1/5	0	-1/5	18/5]
[]
[0	1	-1/5	-2/5	0	2/5	4/5]
[]
[0	0	-7/5	-4/5	0	-M + 4/5	-32/5]

Point of solution:

[18/5 4/5 0 0 43/5 0]

Task is done!

Function value at the point: -32/5